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ABSTRACT

This paper addresses several problems relating to the use of research materials and information resources by graduate students and proposes teaching educational research skills in an introductory-level graduate research course, "Information Resources for Educational Research," to be taught by the Memphis State University (MSU) Library reference staff in fall 1986. Problems in teaching the research use of literatures are identified; goals and objectives for information use are set forth; current instruction in the use of education resources at MSU is evaluated; and the need for effective training in effective information-seeking behavior is emphasized through discussions of preliminary research on the literature use competencies of MSU graduate students and studies reported in relevant literature. In addition, the relationships of content and process are examined in relation to traditional bibliographic instruction activities, and the expectations of competencies for graduate students in educational research are enumerated. The course proposal includes the description of a diagnostic test and an outline of class presentations that would identify professional, scientific literatures and focus on literature research strategies such as concept identification, information needs, and information resources. Finally, the need for faculty and library cooperation is considered. Four references and two illustrations of a research productivity timeline are provided. (KM)

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Information Resources, Perspectives and Strategies for Graduate Educational Research: a course proposal outline and rationale

by

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September, 1986

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Information Resources for Educational Research:
Perspectives and Strategies

1.0 Introduction

This proposal seeks to address matters of concern for graduate students in education, the teaching faculty involved in introductory and advanced research classes and library staff as together they approach the problems of information access in support of educational research efforts.

Most of us would recognize that the research literature in education is diverse and abundant and that this literature is of considerable importance to the vitality of the field in general and essential to the individuals' specialized and focused research and learning activities. The effective use of information resources is of increasing importance in the various research applications whether those researches tend toward the theoretical or toward the practical. The effective use of information resources is always supportive of curricular activities by broadening the scope of learning opportunities and expanding the range of application of course-based learning beyond the text, sylabus and reading list. The emphasis on professional development, life-long learning and the research foundation for educational practice suggests an enhanced and enlarged role for information resource use strategies. Information use skills can provide necessary foundation behaviors useful throughout the intellectual careers of the individual.

This proposal will outline the issues involved and provide a preliminary program for addressing some of these concerns. It includes a rationale, with goals and objectives, a critique of current practices, a proposal for an information resources introduction and training module for in-class use, and a statement on the involvement and cooperation of library staff and teaching faculty.

In its preliminary for, this program can be applied in the Fall Semester, 1986.

2.0 Rationale

Educational research literature constitutes a scientific information system denoted by several significant characteristics. It is grounded in a theoretical foundation which supports the entire field of study. A formal system of communication exists to inform participants of research findings through diverse publication and reporting outlets. A body of research activity exists which is founded on principles of scientific research in general including hypotheses, experimentation, testing, reliability and validity, and evaluation of results. Formal and informal secondary review literatures summarize and report the advances in research and synthesize and assimilate research findings. An elaborate system of secondary and tertiary research materials, guides and mechanisms exist to organize and identify research publications.

Individual and collective participation in the information system appears to be growing not only as readers consult the published materials, but also more significantly, as more articles are written and published and more journals come into existence. This increase in productivity is motivated by an increased reliance on the research based literature. Advances in the field are more frequently reported and more widely counsulted.

Because of the complexity and diversity of the educational research information system it requires study and understanding in advance of effective use. Our collective experiences and the extant research findings indicate that current levels of literature use by students and professionals are low and that educational research materials are semmingly not adequately known. Whether this low use and absence of knowledge are causally related is a matter of speculation but an informed guess is that they are.

Instructors involved with classes which teach introductory research methods are concerned with a variety of educational research issues. Their

teaching practices reveal some diversity and various emphases in this vast domain. One underlying assumption is that this diversity is good and in no way should be affected by the implications of this proposal. This proposal does assume also that there exists value for the student of educational research in a higher order knowledge of the literature and information sources in the broad area of educational research which can be provided to supplement the existing curricular content afforded in these classes.

2.1 Goals

This proposal may be expressed in the form of these goals:

> To acquaint students of educational research with the scope, content and diversity of information resources and literature of educational research;
>
> and,
>
> To encourage students to understand information research as a process of information needs addressed by appropriate behaviors of analysis and information gathering to facilitate problem solving in their professional lives.

2.2 Objectives

These goals can be expressed in terms of these objectives.

1. Students will learn the basic characteristics of educational research information resources in terms of their scope, content, diversity of type, volume, and availability.
2. Students will come to understand information resources as the principal medium of scientific, professional and scholarly communication.

3. Students will come to an awareness and comprehension of their relation to the information resources and the literature of educational research by understanding the variety of information and its potential usefulness to their own purposes.
4. Students will learn strategies and methodologies of applying their knowledge of information resources to their own information needs.
5. Students will learn to analyze their information needs and address these needs to appropriate resources by recognizing relationships, discriminating among available choices and identifying representative patterns of useful and productive behavior.
6. Students will come to a synthesis of information resource availability, with an understanding of information needs and understanding of their own existing and emergent information behaviors.
7. Students will come to a level of self- and problem-evaluation that will afford opportunities, methods and strategies for assessing their own information gathering activities and provide the basis for on-going refinement of their activities toward increased productivity and effectiveness.

3.0 Critique of Current Conditions and Practices

In general graduate students, for whatever reason, often appear to be poorly prepared to undertake rigorous literature based research work at the graduate level. This is a frustrating and threatening situation for faculty and librarians both. How can the student gain from the experience of research literature when that literature is for them a largely unknown element in their lives? Using as an example of this Illustration 1, we may characterize the progress of a research project along a hypothetical line A-Z with time progressing A to Z. If we take point A to be that moment

RESEARCH PRODUCTIVITY TIME LINE

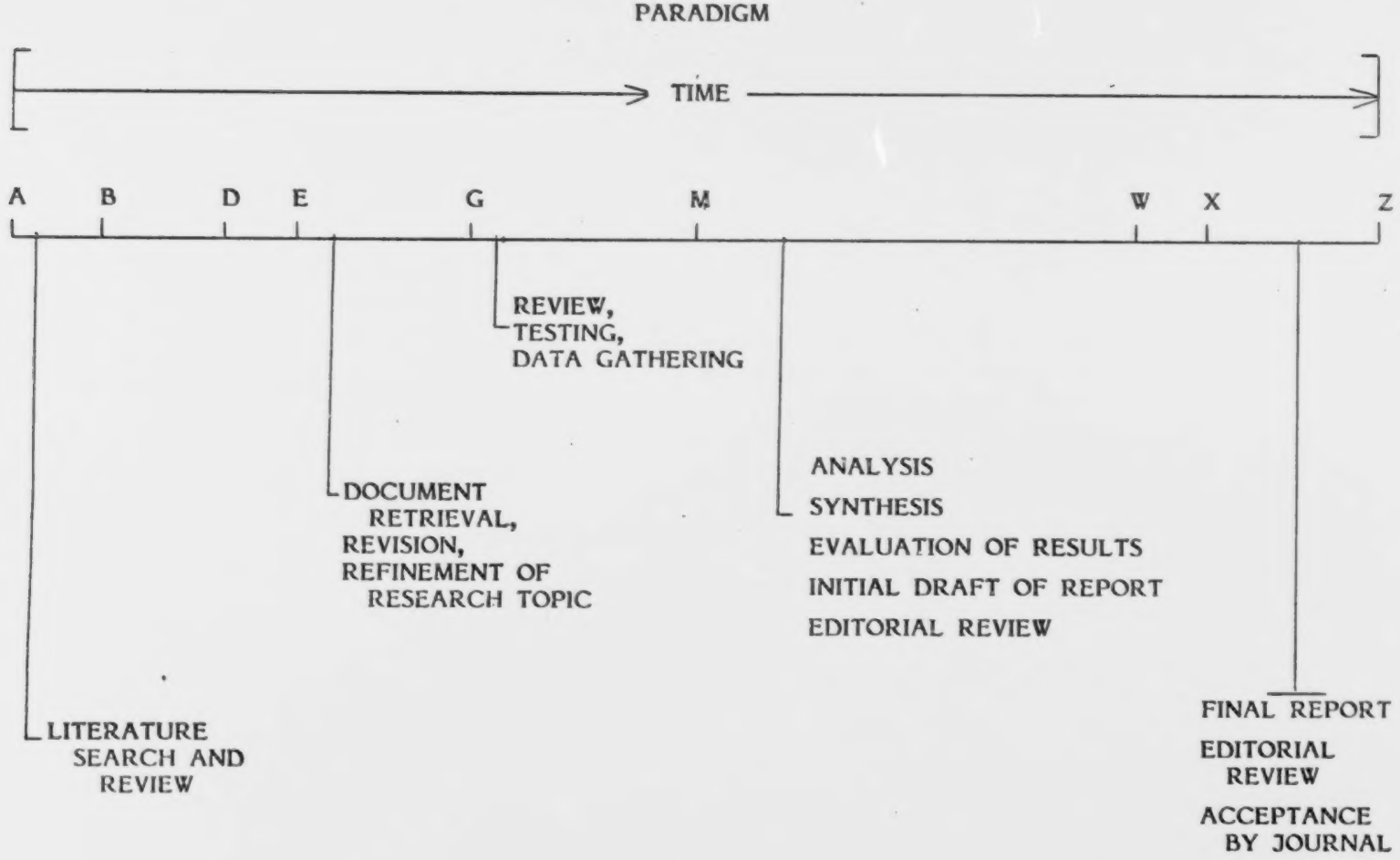

Illustration 1

when the initial statement of the research problem is formulated and Z as the moment of publication of a document recording the results of that research, the rest of the intervening time line is divided among the other tasks known as research and writing for publication. The segment of this productivity time line B through D could represent that portion of the research that focuses on literature searching and literature review and the increments E through G may stand for document retrieval, revised research efforts, refinement of the topic in view of other reported research and a general movement toward specification of the research hypothesis and related work. Segment G through M could include expermentation, review, testing and data gathering while segments M through W would be devoted to the work of analysis, synthesis and the evaluation of results including initial drafts of the final report. Segments X-Z would include the polishing of the final report, editorial review and acceptance of the report as an article to be published. This we may hypothesize as a model for research work in a scientifically grounded field of which education is one example.

What we actually observe is, on the contrary, a situation (as depicted in Illustration 2) where the preliminaries of research, Steps A-G, become disproportinately large, consuming a much larger portion of this finite time scale A-Z. This skewing of the incremental time on task of literature use occurs to the detriment of the other more intellectually demanding tasks of research work, namely, assimilation, synthesis, and evaluation of research findings. One observation is that students are poorly prepared to access the necessary literature whether to perform a literature review per se, or to examine competing ideas, or to critique a test, methodology, treatment plan, or even to refine their own research ideas. What appears to be wanting is a knowledge of materials and methods, content and process, resources and strategies which would serve to facilitate the information seeking behavior

RESEARCH PRODUCTIVITY TIME LINE

PARADIGM VS. REAL TIME EXPERIENCE

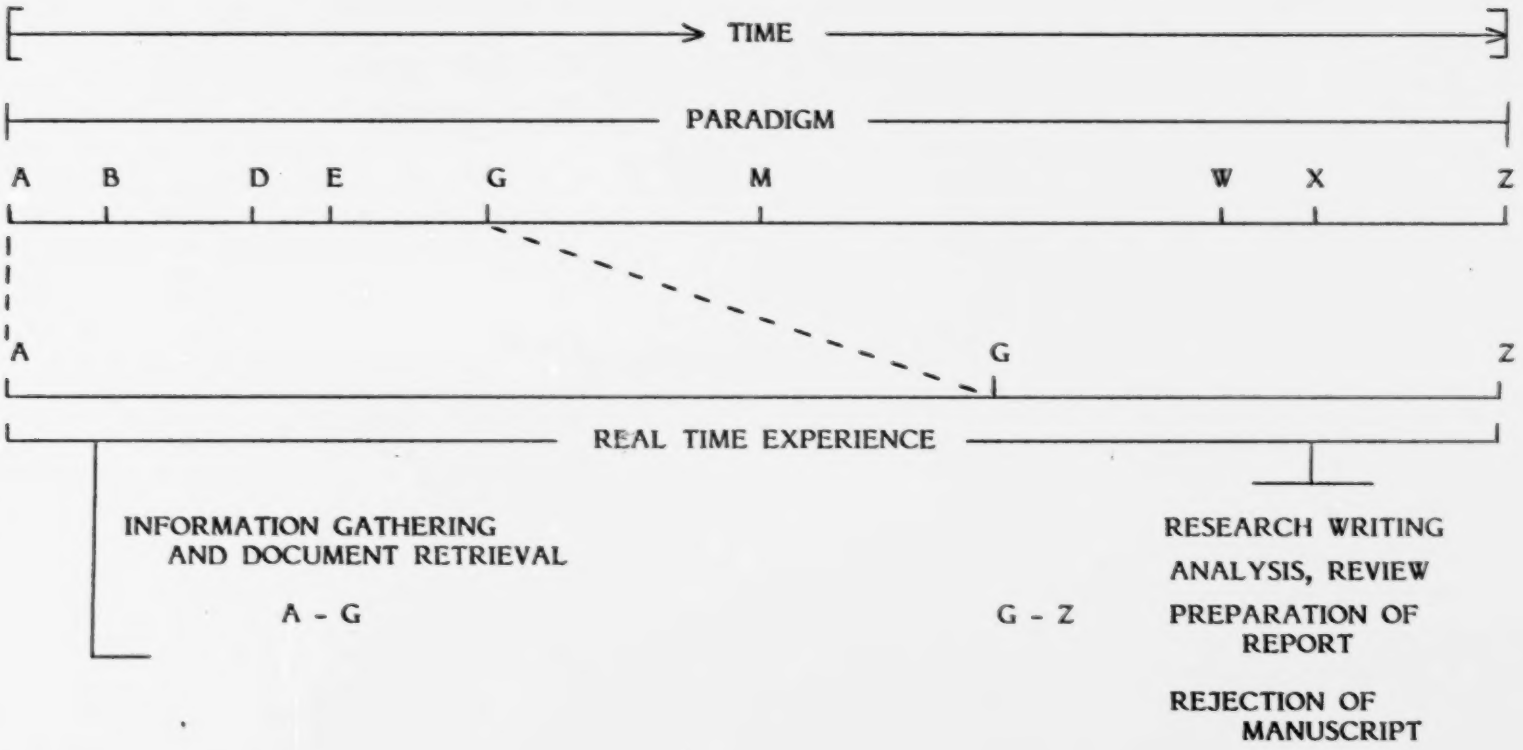

ILLUSTRATION 2

process.

Reference and research library staff have long recognized that the meaning of a text passage is obscured or denied if that passage cannot be secured or effectively accessed. Returning to our time line, we observe that as access is frustrated and content obscured, several defects may accrue in what otherwise may be a worthwhile, if not essential, project. Literature or other information resources may be omitted entirely or their full content not acknowledged or, more importantly, the necessary intellectual activity of assimilation, analysis, synthesis and evaluation (which is the true intellectual work of research) may be foreshortened by the pressure of time. The information professional who authors this proposal is under no illusions. The work of the research endeavor, whether by students or faculty, is an activity that takes place outside the library environment. Librarians are merely responsible for making the documentation of earlier research work readily available and accessible to the researcher. Our concern is that the literature and information resources of educational research have grown so large in number and complex in presentation that in a modest way they demand topical and analytic study in and of themselves to elaborate their utility and their use.

3.1 Nature and Extent of Current Activities

At present instruction and training in the use of information resources are centered in classes taught in the College of Education under the general heading of Introduction to Education Research. Having several years contact with those classes as library colleagues and as students we recognize that the teaching methods, as well as the content, are at a considerable variance from one section to another, from one professor to another. This reflects no defect in and of itself; yet, it does denote the wide variety of current

educational research endeavors. One professor may emphasize statistics, while another may focus on the evaluation of research literature. All of these aspects are of importance in educational research and some of these have advanced classes that follow from this introduction. The point to be made clear, here, is that reliance on the recorded, cumulative and organized literature and information resources of educational research is itself a foundation of education as a scientific discipline, as mentioned previously. Students, regardless of their eventual disposition as professional educators, require training and instruction in the role, content and use of their professional literature beyond what is currently afforded. This is meant as no criticism of the on going activities. Chiefly, it serves to describe a need which at present is not fully met within the confines of the various emphases or agenda of the sections as currently presented.

Several faculty in these classes already make use of reference staff to conduct brief (one class session, 1-2 hours duration) instructional sessions designed to highlight or identify salient resources for information access and use. These presentations are useful but they are often conducted at a level entirely too informal for effective learning and largely devoid of the perspectives and strategies we find necessary for support of productive research. Furthermore, the outline for proceeding in these sessions is largely ill-formed and generally the subject of discussion between one of several librarians and one of several faculty. Our goal in this offering is to systematize the content, the process, the goals and objectives, and the procedure by which this is done. In so during the intent is to incorporate some higher order perspectives, strategies and problem sovling techniques relevant to individual research work in information resources. Additionally, this course module should expand to include use, by the students and the faculty, of online databases available through the Reference Departments's Information

Retrieval Service.

3.2 Preliminary Research at MSU

During the Spring Semester 1986 a small survey [Park, 1986] was conducted of graduate students (N=25) in EDRS 7521 sections at Memphis State University to determine their frequency of use of various information sources and avenues of information seeking. Also sampled were their attitudinal responses to information gathering activities. This preliminary research was conducted by Betsy Park, Reference Librarian, MSU Libraries, to compare responses from MSU users with other published research findings. No conclusions can be put forward at this point owing to the small sample. For that group only, though, the data may be judged descriptive, if preliminary. The results do point to the need for additional research.

On a descriptive basis these students can be seen as relatively unsophisticated users of information relying largely on direct access mechanisms, such as textbooks or books in their possession and professional journals to which they had direct access. Direct access, here, is an inference drawn from the researcher in that this same group reported low usage of accessing mechanisms such as abstracts, indexes, bibliographies or computerized information retrieval services. Contrasting these behaviors with a similar self-reporting of "need" this group emphasized the importance of "aughoritative, accurate and objective" information resources for the conduct of their researches. The contradiction here resides in their avoidance, dis-use or at least non-use of the very information pathways that would lead to the domain of literature that would satisfy their expressed needs. The journal literature which they did use was on a limited scale; the range of regular reading was from zero to six journals. Most respondents (80%) read three or fewer journals on a regular basis.

Impediments to research and reading were also identified in this study. Fully 92% of the respondents cited time constraints as the most significant.

barrier to information gathering and use. Though 32% of the respondents considered themselves "very successful" at information seeking, 64% characterized their efforts as only "somewhat successful."

Perhaps the greatest significance of this study is found in the summarizing paragraph of the section of the report which reads.

> All but one of the respondents stated that their primary purpose for seeking information was coursework. This may explain the behavior exihibited, even the lack of time spent in information seeking. It is interesting to note that these responses do not correspond to models which emphasize interpersonal communication, attendance at meeting and conferences, use of footnotes and bibliographies in books or articles read, etc. It is also interesting to note that these students, all but three of whom worked part-time, did not value information sources which would keep them current in their chosen field. Their behavior with regard to information emphasized the use of textbooks and sources regarded as authoritative. This may be more typical of the student than the professional. It might be interesting to survey these same students after they have completed their graduate education to determine if their behavior changes after coursework.

The significance of this preliminary finding should not be overlooked. If our aim is to provide for the professional training of educators whose reliance on scientifically founded and communicated information should be assured, then steps should be taken to heighten their awareness of the full range of information resources available to support their continuing educational practices and research. In the interest of this professional development, as well as creating a cadre of sophisticated information consumers who can become researchers, hence information producers, training in effective information seeking behaviors can provide much needed strategies, process and methodologies. Aside from the intellectual support that such training could provide it will also meet the immediate needs of the students whose time is limited, affording more attention to the intellectual content of the literature and less to the frustration with working inefficiently through the existing mechanisms of the information seeking activity.

3.3 Review of Relevant Literature

For many students at the entry level of graduate study their previous work in school has been directed at assembling the fundamental knowledge of their chosen field. They would have had little or not training as professional or scholarly researchers. Undergraduate curriculums are characteristically based in the lecture and textbook style of teaching, supplemented by a reserve or outside reading list and requiring little or no independent literature searching or information gathering. Research studies summarized by Stoan [1984] reveal that this pattern appears to predominate and has remained unchanged for at least 50 years.

Other students may be returning to the classroom after a lapse in formal education or after a career change or similar life cycle occurrence. Their familiarity with education as a research discipline may be limited, out of date, or wholly absent. For these students, access to the literature can serve as an active adjunct to their in-class training. Regardless of their origin or current status, all of these students are moving toward professional involvent in educational research either as consumers or producers of research information. Skillful use of the literature is requisite.

Summers, Matheson & Conry [1983] report the findings of a multivariate survey of respondents (N=1078) all of whom were practicing educators in British Columbia. Though the study was not directed at the same purpose as the present proposal its findings may be of value. This survey examined not only information seeking behavior itself but tested these variant behaviors against such factors as personal attributes, professional position and psychological characteristics. Too complex for a detailed summary here, the findings of this sample research indicate that "by far the strongest factor in explaining the variance in use of sources was attitude toward information." Significant factors testing the effects of attitude on characteristics of information

ranked as follows: 1. Near at hand, available; 2. Easy to use; 3. Authoritative, reliable and objective. The reported significance level was p 0.01. The implications of this analysis suggest that a program of instruction, training and familiarization would be useful in fostering better, more positive attitudes toward information and, thereby, its more productive use.

3.4 Content and Process

The study of information resources and literature appropriate to educational research has, at its most fundamental level, a core of knowledge content which must be acquired. This foundation once achieved, the student/learner can move rapidly to higher order interactive and learner-based concerns and problems. Students of information systems quickly realize that the chief characteristics of information research based in problem solving activities is that the activity itself is largely transdisciplinary in nature and it is content independent. The true object of this "teaching" is not the content but the process. The content does not exist in the same sense as the content of physics, biology, history or even education itself. The content is not content at all, but process. What content there is exists as the medium through which the process is instantiated in the research activity paradigm. Perhaps herein resides the greatest benefit of this proposal. The students learn the process, the strategy, and the methodology all in a supportive and intentional environment directed at initial problem solving. The problem may or may not be solved in itself but the process is instantiated and can be re-used whenever the need arises in subsequent study, research, and professional development.

Information seeking behavior can be characterized as strategy, process and methodology. It may be characterized as a strategy in that it is a fully intentional, cognitive act requiring researchers to analyze their information

needs, to map those needs through an appropriate activity, which is the informing process, to a relevant type of literature within the scientific information structure existing for the field. This strategy will reveal the target of the information need and generate a "return" on the activity.

Information seeking behaviors can be characterized as process in that information seeking is iterative, heuristic, recursive and stochastic.

The process is iterative in the sense that as the process moves ahead, the contents of each successive result or the results of each successive information gathering task are subsumed and cumulated in the mind of the researcher. These findings continuously reform and refine the information seeking task, the research problem itself, for successive researches toward resolution of the problem.

The process is heuristic in that the use of the information constitutes an unfolding of the knowledge surrounding the topic. Information gathering aids in the problem-solving activity in part not only for the content of documents, but also through the process of analysis and discovery as well. Information seeking activities reveal the nature of the problem and provide the exploratory examination of the topic as a topic as well as demonstrating the needed problem-solving techniques in addition to the content yield. Effective information gathering is, in its purest form, a learning process for that topic, that field of study and for the activity itself.

The process is recursive in that multiple, repetitive attempts are made to uncover much the same content, scope or type of information from different sources. These recursive acts are necessary for a variety of tasks whether those be for corroboration, elaboration or in response to earlier failed attempts. Successive attempts may vary greatly, not at all, or only slightly from one attempt to another.

The process is stochastic in that it is an activity of informed guess-work, involving intuition, and a skillful discrimination of the information resources

to satisfy the information need. The process of accessing the literature created by others is influenced by external forces beyond the control of the current literature search. Literature sources and information resources are created and exist under constraints of cognitive intent and pragmatic construct which reflect the intellectual, psychological and material attributes and goals of the production effort and available data extant at the time of creation and authorship. These influential variables may include time, place, language, purpose, methodologies available, sample and technique. Furthermore, the process of literature and information resource use can be influenced by a variety of similar intellectual, material, psychological and purposive attributes on the part of the researcher. All of these external and internal variables whether prior or current must be taken into account by the skillful modification and refinement of the research process while it is engaged. The process is not, hence, formulaic and articifial. Information seeking is, thus, a cognitive and intellectual process which requires activity directed at information sources representing different levels of cognitive complexity by way of an array of intellectual filters, process and heiarchies of its own nature and structure. This stochastic approach is greatly facilitated by experience and practice with the literature itself and on its own terms.

The information seeking process can also be seen as a methodology in that an overriding concern in the strategic and process oriented activities is literally the methodical treatment of the problem whether that be in a logical, time-sequential, space-sequential, or concept-sequential phenomena of cognitive ordering of intellectual tasks. This phenomena obtains whether the activity is directed at discovering a complex research subject or is as simple as systematically scanning all issues of an index.

3.5 Summary

Current literature instruction efforts stand as a useable but inadequate program of information seeking behavior training. Information access is a more complex set of activities than is generally acknowledged. Available research literature and local research samplings suggest more elaborate programs are needed.

4.0 Competencies and Expectations

Generalized experience, observation, professional interactions and faculty interviews suggest the following enumeration of competencies for graduate students in educational research.

The student should have:

1. Working knowledge of primary research and secondary review literatures and the ability to discriminate and interpret these by type and content.
2. Familiarity with professional research journals and report literatures.
3. Knowledge and use of indexing and abstracting systems and services.
4. Knowledge of concept formation for literature research activities.
5. Knowledge of basic reference materials for data gathering and knowledge acquisition on a self-directed and effective basis.
6. A functional understanding of research and access methodologies and strategies.
7. A functional understanding of the scope, content and diversity of the formal communications system of educational research.
8. The ability to analyze and define information needs.

9. Knowledge and use of computerized information retrieval mechanisms.

5.0 Proposal: Information Resources for Educational Research

5.1 Diagnostic Test

Early in the semester a diagnostic test will be distributed for completion by the students. Its several parts will include (1) a series of questions modelled after the instrument used by Summers, Matheson and Conry [1983] and modified by Park [1984] (2) a series of questions used by Evans and Palmer [1984] and (3) specific questions on library systems and services designed specifically for researchers with little or no familiarity with MSU Libraries. The results of this pre-test will be used to determine the specific contents of the in-class presentation and will in general be reported back to the students and faculty for their information and use.

5.2 Outline of proposed class presentation

5.2.1 Introduction: The role and function of research and publication in the communication channels of educational research;

5.2.2 Current dynamics of information production and dissemination, size, diversity, origin, history;

5.2.3 Awareness of information sources, information flow, structure of literatures, organization, information transfer;

5.2.4 Analysis of information needs, approaches to literatures, concept identification, access points, formal and informal pathways of scholarly communications;

5.2.5 Strategies for information research, moving from subject/need to resource/strategy; defining strategy, search and research,

document identification;

5.2.6 Use of electronic, online databases for research;

5.2.7 Response to individual questions and report of diagnostic test results;

5.2.8 Evaluation of presentation by students and faculty (to be returned later).

5.3 Commentary

The presentation has two parts. The first segment 5.2.1 - 5.2.3 focuses on broader, more generalized and preliminary perspectives on educational research literature and education in general. The second portion, 5.2.4 - 5.2.7 focuses more explicitly on the resources and strategies for use. Whereas the second portion approximates the content of existing activities it is a considerable advance in approach for it demonstrates effective strategic concerns in its process orientation. The first segment, heretofore not used in this regard, is a necessary component for it provides a much needed perspective and integration of the literature's structure and form emphasizing the relationships of scholarly communication artifacts.

6.0 Faculty and Library Cooperation

We recongize that this module of instruction will require a committment of time from existing class schedules which are already planned. Our belief is that these contributions will facilitate this total effort. Adequate and full presentation of these contents and procedures would require 2-3 hours of class time. Shorter versions could be provided but at the expense of some levels of understanding and integration of knowledge and are not recommended.

6.2 We strongly urge that time be set aside for training students in the use of the online system, either as personal searchers using the existing U-Search

process, or as indirect searchers by submitting search requests to our Information Retrieval Service. Either approach has its benefits and uses. As the presentation is described (supra) this activity is included. The Educational Research Department should consider allocating or uncovering funding for online searching for each student or requiring that the students pay for it themselves. Estimates for search costs would run $10-15.00 per student to allow for free and uninhibited use of this mechanism in a training/teaching environment.

7.0 Conclusion

The foregoing is an elaborate and, some would say, ambitious plan. It is focused at a future of enhanced quality in research, productivity and professionalism. We value your comments and observations. We look forward to future opportunities for interaction and cooperation.

8.0 Acknowledgements

The author values and appreciates the many contributions made by Betsy Park, Sharon Mader, Janell Rudolph and Georgiann Steinhauser in the preparation and contents of this document and Yulanda Wallace for her careful preparation of survey instruments, instructional materials and manuscripts as well as data processing assistance. The contributions, intellectual and practical, of Dr. Dean Butler and Dr. Henry Zurhellen are gratefully acknowledged.

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